

## **Occupancy Sensor with Firearm Discharge (Gunshot) Detection and Alert Signaling**

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Occupancy sensors may employ one or more sensor elements to detect occupancy/vacancy to control lights and other electrical loads. Examples of such sensor elements include passive infrared (PIR), ultrasonic, microwave, audio, and video, or a combination thereof (e.g., multi-technology sensors).

Occupancy sensors are commonly required by building codes in commercial buildings, schools and places of assembly. Based on their placement, occupancy sensors may be advantageously positioned to also detect and mitigate emergencies (in addition to detecting occupancy and controlling loads).

For example, an occupancy sensor with an audio sensor (e.g., a microphone) may include a processor to perform digital audio signal processing of the output of the microphone to detect an emergency. For example, such an emergency can be detected based on the audio signature of a firearm discharge (e.g., a gunshot) or based on human speech indicative of such an emergency.

If a firearm discharge is detected, an interface of the occupancy sensor (e.g., a radio, network, ethernet, fiber optic, hardwired) could be used to send an immediate alert to an external alarm (e.g., life/safety) system. In addition, first responders (e.g., police, fire) may be automatically alerted.